

2/21/03 09/536,460

FILE 'REGISTRY' ENTERED AT 13:50:03 ON 21 FEB 2003

E-AG.CL/MF
L1 2 S E3
E AG CL/ELF
L2 142 S E3
E BR.CS/MF
L3 3 S E3
E BR CS/ELF
L4 29 S E3
L5 173 S L1-4

FILE 'HCAPLUS' ENTERED AT 13:51:55 ON 21 FEB 2003

L6 109 S SURFACE FIGURE
L7 2498 S ATHERMAL#####
L8 1 S L6 AND L7
L9 31120 S NONTHERMAL? OR NON THERMAL? OR (THERMAL### OR HEAT#### OR TEM
L10 1 S L6 AND L9
L11 9650 S L5
L12 45 S L11 AND L6-9
L13 0 S L11 AND L6 AND (L7 OR L9)
L14 0 S L11 AND L6
L15 45 S L11 AND (L7 OR L9)
L16 2 S L15 AND (SURFACE OR POLISH? OR ROUGH? OR FINISH?)
E OPTIC/CT
E OPTICAL DEVICE/CT
E OPTICS/CT
E E3+ALL/CT
E E19+ALL/CT

FILE 'STNGUIDE' ENTERED AT 14:01:36 ON 21 FEB 2003

FILE 'HCAPLUS' ENTERED AT 14:01:47 ON 21 FEB 2003

L17 31710 S E2-20
L18 37737 S E21-50
L19 102643 S E51-75
L20 22441 S E76-100
L21 22343 S E101-125
L22 42553 S E126-150
L23 60333 S E151-180
L24 17 S L6 AND L17-23

FILE 'HCAPLUS' ENTERED AT 14:53:36 ON 21 FEB 2003

L25 1 S L6 AND L7
L26 45 S L5 AND (L7 OR L9)
L27 0 S L24 AND L5
L28 10 S L26 AND (?OPTIC? OR LIGHT##### OR ILLUMINA##### OR FLUORESC#
L29 1 S L28 AND (POLISH##### OR SURFACE)

FILE 'STNGUIDE' ENTERED AT 14:58:16 ON 21 FEB 2003

FILE 'HCAPLUS' ENTERED AT 14:59:40 ON 21 FEB 2003

L30 9 S L28 NOT L29

FILE 'STNGUIDE' ENTERED AT 15:00:05 ON 21 FEB 2003

FILE 'HCAPLUS' ENTERED AT 15:06:20 ON 21 FEB 2003

L31 83595 S (SMOOTH##### OR ROUGH##### OR DAMAG##### OR POLISH#####) (1
L32 319 S L5 (L) (SURFACE OR MIRROR OR REFLECT##### OR ANTIREFLECT#####
L33 10 S L31 AND L32
L34 10 S L33 NOT L28

FILE 'STNGUIDE' ENTERED AT 15:08:24 ON 21 FEB 2003

FILE 'HCAPLUS' ENTERED AT 15:09:44 ON 21 FEB 2003

FILE 'STNGUIDE' ENTERED AT 15:09:52 ON 21 FEB 2003

FILE 'HCAPLUS' ENTERED AT 15:10:35 ON 21 FEB 2003

L35 30225 S L5 OR AGCL OR CSBR OR (AG OR SILVER) (W) CHLORIDE OR ("CS" OR C
L36 33630 S L9 OR (THERMAL### OR TEMP OR TEMPERATURE OR HEAT####) (2A) (NON

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L37 87 S L35 AND L36
L38 6 S L37 AND (CTE OR EXPAN#####)
L39 2 S L37 AND REFRACT#####
L40 7 S L38-39

FILE 'STNGUIDE' ENTERED AT 15:48:21 ON 21 FEB 2003

L41 FILE 'HCAPLUS' ENTERED AT 15:53:35 ON 21 FEB 2003
0 S L37 AND SURFACE FIGURE

L42 FILE 'HCAPLUS' ENTERED AT 15:53:57 ON 21 FEB 2003
0 S L37 AND SURFACE AND PEAK(2A)VALLEY
L43 9 S L37 AND SURFACE
L44 0 S L37 AND PEAK(2A)VALLEY

FILE 'STNGUIDE' ENTERED AT 15:54:53 ON 21 FEB 2003

L45 FILE 'HCAPLUS' ENTERED AT 15:58:09 ON 21 FEB 2003
275 S L5 (L) SURFACE
L46 1 S L36 AND L45

L47 FILE 'EUROPATFULL, PCTFULL' ENTERED AT 15:59:53 ON 21 FEB 2003
4778 S SURFACE FIGURE OR (SURFACE(5A)VALLEY AND PEAK(2A)VALLEY AND S
L48 401 S SURFACE(6A) (AGCL OR CSBR OR (AG OR SILVER) (W)CHLORIDE OR ("CS
L49 9 S L47 AND L48

FILE 'STNGUIDE' ENTERED AT 16:01:57 ON 21 FEB 2003

L50 FILE 'EUROPATFULL, PCTFULL' ENTERED AT 16:04:16 ON 21 FEB 2003
5883 S (ATHERMAL#### OR NONTHERMAL? OR NON THERMAL#### OR (THERMAL##
L51 2 S L48 AND L50

FILE 'STNGUIDE' ENTERED AT 16:05:29 ON 21 FEB 2003

L52 FILE 'DPCI' ENTERED AT 16:06:32 ON 21 FEB 2003
0 S US6486999/PN.G

FILE 'STNGUIDE' ENTERED AT 16:06:55 ON 21 FEB 2003

L53 FILE 'DPCI' ENTERED AT 16:08:05 ON 21 FEB 2003
43 S (US4497544 OR US4615587 OR US4886331 OR US5212584 OR US545979
SEL PRN

L54 FILE 'HCAPLUS' ENTERED AT 16:08:28 ON 21 FEB 2003
20 S E1-63
L55 0 S L35 AND L54

L56 FILE 'DPCI' ENTERED AT 16:09:16 ON 21 FEB 2003
88 S (US4497544 OR US4615587 OR US4886331 OR US5212584 OR US545979
SEL PRN

L57 FILE 'HCAPLUS' ENTERED AT 16:09:42 ON 21 FEB 2003
31 S E64-186
L58 0 S L35 AND L57

L59 FILE 'DPCI' ENTERED AT 16:10:25 ON 21 FEB 2003
88 S (US4497544 OR US4615587 OR US4886331 OR US5212584 OR US545979
SEL PN.D
DELETE EXPAND
SET SMARTSELECT ON

L60 SEL L59 1- PN.D : 847 TERMS
L61 SEL L59 1- PN.G : 744 TERMS
L62 SEL L59 1- PRN : 123 TERMS
L63 6953 S L60
L64 4810 S L61
L65 118 S L62
L66 10837 S L63 OR L64 OR L65
L67 839 S L66 AND SURFACE
L68 2378 S L66 AND G02F?/IC
L69 4679 S L66 AND OPTIC#####

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L70 0 S L66 AND (CESIUM OR CS OR CSBR OR BROMIDE)
L71 51 S L66 AND (AGCL OR AG OR SILVER)
L72 1944 S L66 AND (POLISH? OR MIRROR? OR REFLECT? OR ANTIREFLECT? OR WI
L73 539 S L67 AND (L68-69 OR L72)
L74 589 S L71 OR L73
L75 SEL L74 1- PRN : 913 TERMS

FILE 'HCAPLUS' ENTERED AT 16:16:43 ON 21 FEB 2003

L76 234 S L75
L77 2 S L35 AND L76

21feb03 16:28:54 User259284 Session D2112.1

SYSTEM:OS - DIALOG OneSearch

File 2:INSPEC 1969-2003/Feb W2
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*File 6: Alert feature enhanced for multiple files, duplicates removal, customized scheduling. See HELP ALERT.
File 8:Ei Compendex(R) 1970-2003/Feb W2
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File 25:Weldasearch 1966-2002/Aug
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*File 94: UDs have been adjusted to reflect current months data. There is no data missing.
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File 96:FLUIDEX 1972-2003/Feb
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(c) 2003 Contains copyrighted material
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File 118:ICONDA-Intl Construction 1976-2003/Feb
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File 240:PAPERCHEM 1967-2003/Feb W3
(c) 2003 Elsevier Eng. Info. Inc.
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*File 248: Changes have been made to Subject Headings and Codes as of July 2002. See Help Codes248 for a complete list of Subject Headings.
File 315:ChemEng & Biotech Abs 1970-2002/Dec
(c) 2002 DECHEMA
File 323:RAPRA Rubber & Plastics 1972-2003/Feb
(c) 2003 RAPRA Technology Ltd
*File 323: Alert feature enhanced for multiple files, duplicate removal, customized scheduling. See HELP ALERT.
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
(c) 1998 Inst for Sci Info

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File 350:Derwent WPIX 1963-2003/UD,UM &UP=200312

(c) 2003 Thomson Derwent

*File 350: Alerts can now have images sent via all delivery methods.
See HELP ALERT and HELP PRINT for more info.

File 347:JAPIO Oct 1976-2002/Oct(Updated 030204)

(c) 2003 JPO & JAPIO

*File 347: JAPIO data problems with year 2000 records are now fixed.
Alerts have been run. See HELP NEWS 347 for details.

Set	Items	Description
S1	753	AU=(HAYDEN J? OR CONZONE S? OR MARKER A?)
S2	807	AU=(HAYDEN, J? OR CONZONE, S? OR MARKER, A?)
S3	1464	S1:S2
S4	0	S3 AND (AGCL OR (AG OR SILVER)())CHLORIDE? ? OR CSBR OR CES- IUM()BROMIDE? ?)
S5	18	(SCHOTT OR CS=SCHOTT? OR PA=SCHOTT?) AND (AGCL OR (AG OR S- ILVER)())CHLORIDE? ? OR CSBR OR CESIUM()BROMIDE? ?)
S6	14	RD S5 (unique items)
S7	28462	(AGCL OR (AG OR SILVER)())CHLORIDE? ? OR CSBR OR CESIUM()BR- OMIDE? ?)
S8	0	S7 AND (AGERE OR HEWLETT()PACKARD OR CS=HEWLETT? OR PA=HEW- LETT?)
S9	56	S7 AND (CORNING? OR CS=CORNING? OR PA=CORNING?)
S10	2	S7 AND (AGERE OR HEWLETT()PACKARD OR CS=HEWLETT? OR PA=HEW- LETT? OR PA=AGERE? OR CS=AGERE?)
S11	58	S9:S10
S12	54	RD S11 (unique items)
S13	14	S12 AND (ATHERMAL? OR NONTHERMAL? OR TEMPERATURE? ? OR THE- RMAL??)
?		

L77 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2003 ACS

AN 1981:452773 HCAPLUS

DN 95:52773

TI Silver halide-containing film for optical data storage

IN Borrelli, Nicholas Francis; Young, Peter Lung-Chung

PA Corning Glass Works, USA

SO Ger. Offen., 20 pp.

CODEN: GWXXBX

DT Patent

LA German

IC G03C001-46; G11B007-24

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3039500	A1	19810430	DE 1980-3039500	19801020 <--
	GB 2065317	A	19810624	GB 1980-33732	19801020 <--
	GB 2065317	B2	19830706		
	NL 8005793	A	19810424	NL 1980-5793	19801021 <--
	FR 2468147	A1	19810430	FR 1980-22463	19801021 <--
	FR 2468147	B1	19870130		
	JP 56094345	A2	19810730	JP 1980-148107	19801022 <--
PRAI	US 1979-86813		19791022 <--		

AB Inorg. film which is optically bleachable and absorbs in the visible region contains several polycryst. Ag halide layers with additively colored **AgCl** crystals, has a thickness of .ltoreq.2 .mu.m, in the unbleached state exhibits a transparency to 6300 .ANG. of .ltoreq.0.3 and to 8500 .ANG., .gtoreq.0.5, and on a supporting film is useful in optical data storage. The support may be transparent glass with or without a light-reflecting metallic film over which is a barrier layer of metallic oxide. Thus, a reflecting-type data storage system was prepd. on a silvered glass plate with an optically transparent 500-.ANG. Ta2O5 barrier layer by adding 40 300-.ANG. **AgCl** layers alternating with 39 9-.ANG. PbO layers. A point-like spot on the film was bleached with 6329-.ANG. laser light of incident energy 1000 W/qcm for 0.6 ms and its optical anisotropy was detd. The net transparency of 1.8% at 8500 .ANG. and the 0.1% transparency of the background gave a contrast ratio of 18:1. These multilayer films have many advantages: they can be erased and reused repeatedly without change in their properties; a strong reading source can be used without danger of erasure to give a strong signal with little distortion; by suitable arrangement of the stored data a scale of optical d. can be prepd., which makes possible analog operation.

IT 7783-90-6, uses and miscellaneous

RL: USES (Uses)

(optical data storage films contg. alternating layers of lead oxide and)

RN 7783-90-6 HCAPLUS

CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

L40 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2003 ACS

AN 1965:413614 HCAPLUS

DN 63:13614

OREF 63:2414a-c

TI The thermal **expansion** of alkali [metal] halides at low temperatures

AU White, G. K.

CS Div. Phys., C.S.I.R.O., Sydney

SO Proc. Roy. Soc. (London), Ser. A (1965), 286(1405), 204-17

DT Journal

LA English

CC 3 (General Physical Chemistry)

AB Linear thermal **expansions** of 8 alkali metal halides were detd. at liquid O temps. and at temps. from 30.degree.K. down to 2.degree.K. For temps. $T \ll \theta_D$, where θ_D is the Debye temp., the **expansion** coeffs. are well represented by $\alpha = AT^3 + BT^6$. Values are reported for the Grueneisen parameter $\gamma = 3\alpha / (C/V \chi)$, where C/V is the heat capacity per unit vol. and χ is the compressibility. For CsBr (body-centered-cubic structure) γ is nearly **independent of temp.**, with a value of 2.0, but for the other crystals, which have the rock-salt structure, the parameter γ varies with temp., chiefly between $\theta_D/10$ and $\theta_D/5$. At room temp., γ lies between 1.45 and 1.7 but at low temp. this generally decreases to a value γ_0 which is ≈ -0.1 for RbI; $+0.3$ for KCl, KBr, and KI; and 1.0 for NaCl and NaI. LiF does not show this decrease, γ_0 being 1.7. The values observed for γ_0 are compared with those calcd. from elastic consts. and their pressure derivs. and the general behavior of $\gamma(T)$ is observed to conform qual. to the predictions of simple theoretical models of Born (Atom Theorie des festen Zustandes, Leipzig: Teubner, 1923), Blackman (CA 54, 20396g), and Barron (CA 51, 12587h).

IT 7787-69-1, Cesium bromide

(expansion (thermal) and Grueneisen const. of)

RN 7787-69-1 HCAPLUS

CN Cesium bromide (CsBr) (9CI) (CA INDEX NAME)

Br--Cs

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L77 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2003 ACS

AN 1990:523539 HCAPLUS

DN 113:123539

TI Nonlinear tunable optical bandpass filter

IN Durand, William W.; Peterson, Ronald E.

PA Honeywell Inc., USA

SO U.S., 5 pp.

CODEN: USXXAM

DT Patent

LA English

IC ICM G02B005-28

ICS G02F001-23; G02F001-01

NCL 350353000

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4929063	A	19900529	US 1986-821291	19860122 <--
PRAI	US 1986-821291		19860122 <--		

AB Tunable Fabry-Perot filters are described which comprise: a substrate; a 1st coating on the substrate; a 2nd coating, comprising Ag₂S, which has activatable nonlinear optical properties and an optical thickness equal to 1/2 the design transmittance wavelengths at ambient temp.; a 3rd coating on the 2nd coating, and activating means (e.g., resistance heating or laser radiation means) for changing the optical properties of the 2nd coating. The 1st and 3rd coatings include material selected from AgCl and TlCl.

IT 7783-90-6, Silver chloride (AgCl),
uses and miscellaneous

RL: USES (Uses)

(optical filters with coatings contg., tunable Fabry-Perot nonlinear)

RN 7783-90-6 HCAPLUS

CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

2/21/03 09/536,460

L40 ANSWER 2 OF 7 HCAPLUS COPYRIGHT 2003 ACS
AN 1986:540068 HCAPLUS
DN 105:140068
TI Temperature invariance and universality of Sharma constant of the condensed phase
AU Sharma, B. K.
CS Dep. Phys., Reg. Coll. Educ., Bhubaneswar, 751 007, India
SO Acoustics Letters (1986), 9(7), 101-5
CODEN: ACLEDI; ISSN: 0140-1599
DT Journal
LA English
CC 65-6 (General Physical Chemistry)
Section cross-reference(s): 69
AB For the rare earth metals, cryst. and molten alkali metal halides, molten alkali metals, and a no. of mol. liqs. (including SnCl₄, CF₄, and n-alkanes), the Sharma const. [So, a dimensionless no. described previously (S., 1983-4)] was calcd. by using only existing exptl. data on the vol. thermal **expansion** coeffs. In all cases, So had an av. value of 1.11 \pm 0.01, and was essentially **independent** of the **temp.**
IT Alkali metal halides, properties
RL: PRP (Properties)
(Sharma dimensionless nos. for cryst. and molten, thermal **expansion** coeffs. in calcns. of)
IT 7787-69-1
RL: PRP (Properties)
(Sharma dimensionless no. for, thermal **expansion** coeff. in calcns. of)
RN 7787-69-1 HCAPLUS
CN Cesium bromide (CsBr) (9CI) (CA INDEX NAME)

Br⁻-Cs

L30 ANSWER 5 OF 9 HCAPLUS COPYRIGHT 2003 ACS
 AN 1970:26652 HCAPLUS
 DN 72:26652
 TI **Optical** constants of cesium halides at low temperatures in the far infrared
 AU Vergnat, Pierre; Claudel, Jacques; Hadni, Armand; Strimer, Pierre; Vermillard, Francois
 CS Inst. Phys. Nancy, Nancy, Fr.
 SO Journal de Physique (Paris) (1969), 30(8-9), 723-35
 CODEN: JOPQAG; ISSN: 0302-0738
 DT Journal
 LA French
 CC 73 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance, and Other Optical Properties)
 AB The far-ir **reflection** and transmission spectra of CsX (X = Cl, Br, I) were recorded at various temps. 25-290.degree.K. These and literature spectra were analyzed in terms of 2 Lorentz oscillators. The static dielec. const. increased with temp. However, the high-frequency limit was **temp. independent**. The main oscillator frequency decreased with increasing temp. Both frequency and damping of the secondary oscillators were **temp. independent** and strength of these oscillators approached 0 at low temps. due to negligible anharmonicity. For CsI, the strength of the auxiliary oscillator was negligible at every temp. .ltoreq.290.degree.K. Compressibility was calcd. from Szigeti-theory in terms of the principal oscillator frequency. Agreement between the 2 methods was good at room temp. (within 5%) and was very good at 25.degree.K (within 1%) where harmonicity is assumed more applicable. The ratio of the apparent charge of the ion to that of the electron increased with decreasing anion size and was **temp. independent**. The longitudinal **optical** frequency was detd. by 4 different methods as 165, 118, and 91 cm-1 at 25.degree.K. for CsCl, CsBr, and CsI, resp. The transverse **optical** frequencies at 25.degree. K. were detd.: 105, 79, and 65 cm-1 for CsCl, CsBr, and CsI, resp. The **optical** and dielec. consts. were calcd. for 290.degree., 80.degree., and 25.degree. K for wavelengths <1000 .mu. in the IR region and are tabulated.
 IT **7787-69-1**
 RL: PRP (Properties)
 (optical properties of, in far ir region at low temps.)
 RN 7787-69-1 HCAPLUS
 CN Cesium bromide (CsBr) (9CI) (CA INDEX NAME)

Br-Cs

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12/9/5

DIALOG(R)File 2:INSPEC

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03823582 INSPEC Abstract Number: A91034748

Title: Low distortion IR transmitting materials

Author(s): McCarthy Brow, T.; Seegmiller, D.W.

Author Affiliation: US Air Force Weapons Lab., Kirtland AFB, NM, USA

Journal: Proceedings of the SPIE - The International Society for Optical Engineering vol.1307 p.463-73

Publication Date: 1990 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

Conference Title: Electro-Optical Materials for Switches, Coatings, Sensor Optics, and Detectors

Conference Sponsor: SPIE

Conference Date: 16-20 April 1990 Conference Location: Orlando, FL, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: In general, transmissive optics introduce aberrations into transmitted wavefronts whenever temperature gradients exist within or across the optic. The aberrations result from thermally induced optical path length changes, and materials that minimize the effect are often labeled as '**athermal**'. Several groups of materials which appear to meet the criteria for '**athermal**' behavior are glasses possessing highly negative thermo-optic coefficients (dn/dT). Heavy metal fluoride (HMF), phosphate (PP), fluoro-zirco-aluminate (FZA), and fluorophosphate (FP) glasses exhibit this somewhat unusual property. A program to investigate HMFGs, PPs, FZAs, FPs and other temperature insensitive materials has been initiated. Of particular interest is the effect of glass composition on the **refractive** index, index temperature dependence, thermal **expansion** coefficient, and heat capacity. Analyses have shown that the materials under investigation are highly superior to fused silica from a thermally induced optical distortion standpoint. The program has produced a wide variety of glass samples that are now undergoing optical, thermal, and mechanical evaluation. The authors discuss the analyses thus far accomplished. (24 Refs)

Subfile: A

Descriptors: aberrations; fluoride glasses; optical glass; phosphate glasses; **refractive** index; specific heat of solids; thermal **expansion**; thermo-optical effects

L30 ANSWER 7 OF 9 HCAPLUS COPYRIGHT 2003 ACS

AN 1966:452725 HCAPLUS

DN 65:52725

OREF 65:9859b-d

TI Indirect **optical** absorption of AgCl-AgBr alloys

AU Joesten, Burdette L.; Brown, Frederick C.

CS Univ. of Illinois, Urbana

SO Phys. Rev. (1966) 148(2), 919-27

DT Journal

LA English

CC 8 (Crystallization and Crystal Structure)

AB High-resolution measurements of the **optical** absorption edge of pure crystals of AgBr and AgCl are in good agreement with the theory of phonon-assisted indirect transitions. The indirect **optical** absorption of AgCl-AgBr mixed crystals has been studied between 4.2 and 77.degree. K. At 4.2.degree.K., the addn. of AgBr to AgCl causes the absorption edge to shift continuously from the pure AgCl threshold at 3.252 ev. to the pure AgBr threshold at 2.691 ev. Above 5.7 mole % AgBr in AgCl, the absorption coeff. increases steeply to values considerably greater than that of pure AgBr at the same wavelength. The effect of the alloying on the pure-crystal absorption spectra is somewhat different for the 2 extremes of mixing. In AgBr-rich mixed crystals (>90 mole % AgBr in AgCl), a **temp.-independent** component with a sharp threshold is observed at an energy precisely halfway between the indirect phonon-emission and phonon-absorption thresholds (which still appear with phonon energy 0.0082 ev. as in pure AgBr). This suggests that nonvertical transitions can occur in the alloy without the aid of phonons to conserve crystal momentum. The zero-phonon threshold is not so evident for dil. concns. of AgBr in AgCl, where a weak shoulder and tail extend approx. 0.07 ev. to longer wavelengths. Some comparison with theory is given, but present understanding of the band structure of the alloys is rather incomplete.

IT 7783-90-6, Silver chloride

(solid solns. with AgBr, **optical** absorption of)

RN 7783-90-6 HCAPLUS

CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

L30 ANSWER 2 OF 9 HCAPLUS COPYRIGHT 2003 ACS
AN 1997:557225 HCAPLUS
DN 127:300707
TI Time-of-flight mass spectrometric study on UV **laser** ablation of
silver chloride
AU Qin, Qizong; Zhou, Mingfei; Mao, Dunmin
CS Institute of Laser Chemistry, Fudan University, Shanghai, 200433, Peop.
Rep. China
SO Applied Surface Science (1997), 119(3/4), 321-329
CODEN: ASUSEE; ISSN: 0169-4332
PB Elsevier
DT Journal
LA English
CC 73-8 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
AB The formation of neutral and charged ablated species in the pulsed
laser ablation of silver chloride at 355 nm has been investigated
by a time- and angle-resolved quadrupole mass spectrometer as well as a
laser ablation/ionization time-of-flight mass spectrometer. The
dependence of the mass distribution of neutral species on **laser**
fluence shows that the major species obsd. at a **laser** fluence of
0.17 J/cm² are Ag, AgCl and Ag₂Cl, while Ag₂Cl₂ and Ag₃Cl₃ are detected as
addnl. ablated species at **laser** fluence up to 0.4 J/cm². The
measured angular distribution of ablated AgCl can be fitted by a bicosine
function: $\cos^2 \theta + (1-a) \cos \theta$. This result implies that the
nonthermal process plays an important role in the UV **laser**
ablation of silver chloride. On the other hand, both pos. and neg.
charged species of Ag⁺, Ag₂Cl₂⁺, Ag₃Cl₃⁺ and Cl⁻, AgCl₂⁻ and Ag₂Cl₃⁻ are
measured by **laser** ablation/ionization mass spectrometry at a
laser fluence of 0.4 J/cm². A proposed mechanism for the
formation of ablated species in the AgCl **laser** ablation process
is discussed.
IT 7783-90-6, Silver chloride, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(time-of-flight mass spectrometric study on UV **laser** ablation
of silver chloride)
RN 7783-90-6 HCAPLUS
CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

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30 ANSWER 3 OF 9 HCAPLUS COPYRIGHT 2003 ACS
AN 1979:78620 HCAPLUS
DN 90:78620
TI **Optical** absorption of off-center copper(1+) in cesium bromide
AU Rambabu, B.; Ramasastry, C.; Chowdari, B. V. R.
CS Dep. Phys., Indian Inst. Technol., Madras, India
SO Physica Status Solidi B: Basic Research (1978); 90(2), 465-73
CODEN: PSSBBD; ISSN: 0370-1972
DT Journal
LA English
CC 73-3 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance,
and Other Optical Properties)
AB **Optical** absorption studies of Cu⁺ in CsBr were made at 300 to 10
K. Nine absorption bands at 6.15, 5.99, 5.80, 5.64, 5.44, 5.33, 5.09,
4.95, and 4.87 eV could be resolved at liq. He temp. Their intensities
are **temp. independent**. The obsd. spectrum is in
agreement with the calcd. spectrum, if the Cu⁺ ion replaces a Cs⁺ ion and
gets displaced along the .ltbbrac.111.rtbbrac. direction. The crystal
field at Cu⁺ ion is predominantly cubic (.delta.c = -0.45 eV) with a
trigonal component (.delta.t = -0.055 eV) superposed on it.
RN 7787-69-1 HCAPLUS
CN Cesium bromide (CsBr) (9CI) (CA INDEX NAME)

Br⁻Cs

L30 ANSWER 4 OF 9 HCAPLUS COPYRIGHT 2003 ACS
 AN 1972:411732 HCAPLUS
 DN 77:11732
 TI Jahn-Teller effect on transition metal ions in silver halides. III.
 Interpretation
 AU Ulrici, W.
 CS Zentralinst. Elektronenphys., Dtsch. Akad. Wiss. Berlin, Berlin, Fed. Rep.
 Ger.
 SO Physica Status Solidi B: Basic Research (1972), 51(1), 129-38
 CODEN: PSSBBD; ISSN: 0370-1972
 DT Journal
 LA English
 CC 73-3 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance,
 and Other Optical Properties)
 AB The temp. dependence of the **optical** absorptions nvolving orbital
 doublets (Eg) split by dynamic Jahn-Teller effect (JTE) (measured on AgCl
 and AgBr doped with Ti3+, Fe2+, and Cr2+) is discussed. From the results
 obtained for excited Eg states the linear JT-coupling parameters and the
 frequencies of the JT-active .epsilon.g mode are derived. These
 .epsilon.g modes were localized around the impurity ion. The small and
temp. independent oscillator strength of the transition
 between the JT-splitting levels of the Eg ground state (measured on Cr2+)
 is a consequence of the action of the dynamic JET. The weak increase of
 the JT-splitting .DELTA.E of the Eg ground state with increasing temp. is
 caused by the temp. dependence of the frequency of the .epsilon.g mode
 following from the thermal expansion of the crystal.
 IT 7783-90-6
 RL: PRP (Properties)
 (**optical** absorption by transition metal ion-contg., dynamic
 Jahn-Teller effect in relation to)
 RN 7783-90-6 HCAPLUS
 CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

13/9/1
DIALOG(R)File 2:INSPEC
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03209394 INSPEC Abstract Number: A88118396
Title: UV/VIS-spectroscopic studies of cold condensed metal/metal halide films with and without matrix-isolation

Author(s): Gottwald, H.; Weil, K.G.

Author Affiliation: Inst. fur Phys. Chem., Tech. Hochschule Darmstadt, West Germany

Journal: Berichte der Bunsengesellschaft fur Physikalische Chemie
vol.92, no.1 p.60-4

Publication Date: Jan. 1988 Country of Publication: West Germany

CODEN: BBPCAX ISSN: 0005-9021

U.S. Copyright Clearance Center Code: 0005-9021/88/0101-0060\$02.50/0

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Films of about 200 nm thickness were prepared by vacuum deposition of halides onto fused silica **windows**, which were kept at 12 K by a closed cycle helium refrigerator. AgCl, CuCl, and TlCl films showed a structureless absorption edge which extended from about 350 nm to 200 nm. Annealing of the films below 170 K (150 K in the case of CuCl) for more than two hours gave no changes in the absorption spectra. Films which were annealed above this temperature showed at 12 K the exciton bands which are characteristic for the crystalline state of the materials. Cocondensation of 1 to 30 mol.% of metal Me to the halide MeCl gave rise to a broad absorption band around 300 nm which can be assigned to **surface** plasmon excitation of small particles. When the films are annealed, these bands disappear simultaneously with the crystallization of the matrix, and a broad band between 400 and 500 nm is formed. The authors assume that this band is due to Mie scattering of metallic colloid particles. The non-crystalline state is apparently a metastable ionic glass phase. Silver chloride, matrix isolated in Ar or Kr matrices on LiF **windows** shows an UV/VIS spectrum which is different from the gas spectrum. No new bands appear when it is cocondensed with silver atoms. (14 Refs)

Subfile: A

Descriptors: annealing; colloids; copper compounds; crystallisation; excitons; matrix isolation spectra; silver compounds; **surface** plasmons; thallium compounds; vacuum deposited coatings; visible and ultraviolet spectra of inorganic solids

Chemical Indexing:

AgCl sur - Ag sur - Cl sur - AgCl bin - **Ag bin** - **Cl bin**
(Elements - 2)

CuCl sur - Cl sur - Cu sur - CuCl bin - Cl bin - Cu bin (Elements - 2)

TlCl sur - Cl sur - Tl sur - TlCl bin - Cl bin - Tl bin (Elements - 2)

LiF sur - Li sur - F sur - LiF bin - Li bin - F bin (Elements - 2)

Numerical Indexing: size 2.0E-07 m; temperature 1.2E+01 K

L30 ANSWER 8 OF 9 HCAPLUS COPYRIGHT 2003 ACS

AN 1965:443403 HCAPLUS

DN 63:43403

OREF 63:7778b-d

TI Differences in the behavior of crystals and glasses in the absorption of the far infrared (40-1500 μ) at liquid helium temperature

AU Hadni, Armand; Claudel, Jacques; Gerbaux, Xavier; Morlot, Guy; Munier, Jean Marie

CS Univ. Nancy, Fr.

SO Appl. Opt. (1965) 4(4), 487-94

DT Journal

LA French

CC 10 (Spectra and Some Other Optical Properties)

AB Absorption spectra at liquid He temp. in the far ir are given for thick plates of CsI, CsBr, TlBr, TlCl, KI, NaCl, InSb, KBr, CuCl, Al₂O₃, SiO₂, MgO, and LaCl₃. For a thickness of about 3 mm., all these crystals become quasitransparent at very low temp., although they are completely opaque at room temp. This supertransparency of crystals at low temp. gives several far-ir filters with remarkable cutoffs and many available materials to the spectroscopist in a part of the spectrum where only quartz and polyethene were usable up to now. This is also evidence that the main part of the absorption at room temp. comes from the lattice phonons. It decreases with their no. when the crystal is cooled (2-phonon difference process). The small absorption which remains in a few cases (KBr, NaCl, KI) could arise from the 2-phonon addn. process, which is nearly **independent** of **temp.** and gives much less efficient absorption. In the case of glasses, the absorption coeff. is higher by 2 or 3 orders of magnitude and stays const. when the glass is cooled. For quartz glass, the index of refraction also seemed invariant. An explanation is proposed in terms of 1 single phonon process, **independent** of **temp.** and allowed by the disorder characteristic of glassy states.

IT 7787-69-1, Cesium bromide

(spectrum (infrared and microwave) of, at low temp.)

RN 7787-69-1 HCAPLUS

CN Cesium bromide (CsBr) (9CI) (CA INDEX NAME)

Br-Cs

L29 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2003 ACS
AN 1986:24879 HCAPLUS
DN 104:24879
TI Chlorination reaction and **laser** stimulated desorption from
silver **surfaces**
AU Sesselmann, W.; Chuang, T. J.
CS Res. Lab., IBM, San Jose, CA, 95193, USA
SO Surface Science, (1985), 162(1-3), 1007-10
CODEN: SUSCAS; ISSN: 0039-6028
DT Journal
LA English
CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 66
AB Formation of AgCl on Ag **surfaces** exposed to Cl and **laser**
stimulated desorption from chlorinated Ag **surfaces** were studied.
For Cl exposures less than 107 L, a logarithmic time dependence of the
Ag-Cl reaction is obsd. Due to effective subsurface diffusion, the
surface layer is Ag enriched with respect to stoichiometric AgCl.
At higher exposures, a t1/2 time dependence indicates that the diffusion
process becomes reaction rate limiting and a stoichiometric AgCl
surface layer is formed. UV/visible **laser** stimulated
desorption of neutral Cl, Ag and AgCl species is obsd. for **laser**
power less than 150 MW cm⁻². The desorption process is **non-**
thermal in nature. A desorption mechanism based on electronic
excitations is discussed.
IT 7783-90-6P, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in reaction of chlorine with silver **surface**,
diffusion in relation to silver enrichment of **surface** in)
RN 7783-90-6 HCAPLUS
CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

L30 ANSWER 6 OF 9 HCAPLUS COPYRIGHT 2003 ACS
 AN 1968:118228 HCAPLUS
 DN 68:118228
 TI Multiphonon structures in absorption spectra of silver halides containing iodide
 AU Kanzaki, Hiroshi; Sakuragi, Shiro; Ozawa, Shinobu
 CS Univ. Tokyo, Tokyo, Japan
 SO Journal of the Physical Society of Japan (1968), 24(3), 652
 CODEN: JUPSAU; ISSN: 0031-9015
 DT Journal
 LA English
 CC 73 (Spectra and Other Optical Properties)
 AB AgCl and AgBr crystals were grown from the melt under high vacuum and rapidly cooled from 300.degree. before measurements. I⁻ (5 .times. 10⁻⁴ mole) in AgBr produces 2 components of addnl. absorption around the indirect exciton threshold, 2.692 ev. at 2.degree.K., of AgBr. The lower energy component (<2.70 ev.) shows multiphonon structures. The major series is located at 2.641, 2.654, 2.668, 2.681, and 2.694 ev., with an interval of 0.013 ev. The higher energy component (>2.70 ev.) shows similar structures. High resoln. data revealed addnl. weaker series and weaker satellites to the major series. For I⁻ (3 .times. 10⁻⁴ mole) in AgCl, multiphonon structures are observed between the high-energy tail of the band (peak at 3.132 ev. at 4.2.degree.K.) and the indirect exciton threshold, 3.258 ev. at 4.2.degree.K., of AgCl. Structures at 3.207, 3.224, 3.242, and 3.260 ev. occur, with an interval of 0.018 ev. Each structure is accompanied with a weaker satellite. These multiphonon structures are smoothed out >20.degree.K. for AgBr, and >50.degree.K. for AgCl. The absorption components located at the low-energy side of the indirect exciton threshold can be understood as bound indirect exciton transitions. Their absorption strength is **independent** of **temp.** up to 77.degree.K. This suggests that the transition is allowed by momentum conservation owing to disorder, the presence of iodide. Observed multiphonon structures are due to simultaneous emission of phonons with the **optical** transition. The phonons participating in the major series (0.013 ev. for AgBr and 0.018 ev. for AgCl) are quasi-localized **optical** phonons from the presence of iodide.
 IT 7783-90-6
 RL: PRP (Properties)
 (spectrum (visible and uv) of, iodide-contg., multiphonon structure in)
 RN 7783-90-6 HCAPLUS
 CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

2/21/03 09/536,460

L30 ANSWER 1 OF 9 HCAPLUS COPYRIGHT 2003 ACS
AN 2001:451163 HCAPLUS
DN 135:53463
TI Silver halide photographic materials suitable for laser scanning exposure
IN Okazaki, Kentaro
PA Fuji Photo Film Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 34 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM G03C001-09
ICS G03C001-035; G03C001-34; G03C007-392
CC 74-2 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001166411	A2	20010622	JP 1999-349451	19991208
PRAI	JP 1999-349451		19991208		
OS	MARPAT 135:53463				

AB The materials have .gtoreq.1 layers comprising Ag halide emulsions contg. .gtoreq.90 mol% Ag chloride which is chem. sensitized with Au compds. in presence of 1.0 .times. 10⁻⁹-1.0 .times. 10⁻⁵ mol (per 1 mol Ag) .gtoreq.1 compd(s). selected from (A) R₂₁SO₂SM₂₁ and R₂₂SO₂M₂₂ (R₂₁, R₂₂ = aliph. group, arom. group, heterocyclic group; M₂₁, M₂₂ = cation) or (B) R₃₁S₂R₃₂ (R₃₁, R₃₂ = aliph. group, arom. group; R₃₁ + R₃₂ may form a ring) at pH 4.0-5.6. The materials may be color photog. materials. Materials giving photographs of const. d. **independent** of **temp.** are obtained.

IT **7783-90-6**, Silver chloride, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(photog. emulsions comprising Ag chloride sensitized with Au compds. in presence of sulfur compds.)

RN 7783-90-6 HCAPLUS
CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

12/9/3

DIALOG(R)File 2:INSPEC

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4442033 INSPEC Abstract Number: A9316-4278-003

Title: Influence of temperature on diffractive lens performance

Author(s): Behrmann, G.P.; Bowen, J.P.

Author Affiliation: US Army Res. Lab., Adelphi, MD, USA

Journal: Applied Optics vol.32, no.14 p.2483-9

Publication Date: 10 May 1993 Country of Publication: USA

CODEN: APOPAI ISSN: 0003-6935

U.S. Copyright Clearance Center Code: 0003-6935/93/142483-07\$05.00/0

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: The thermal properties of lenses play an important role in the performance of optical systems. The authors discuss the effects of uniform temperature changes and thermal gradients on diffractive lens performance. Comparisons are made between the thermal sensitivity of **refractive** and diffractive lenses. Useful design equations are presented that describe focal length, phase coefficients, and diffraction efficiency as functions of temperature. They present important thermal data for a number of lens materials. The optothermal **expansion** coefficient is used to design **athermalized** lenses that combine **refractive** and diffractive surfaces. (17 Refs)

Subfile: A

Descriptors: lenses; light diffraction; optical constants; optical design techniques; optical systems; photothermal effects; sensitivity

2/21/03 09/536,460

13/9/11 (Item 5 from file: 350)
DIALOG(R) File 350: Derwent WPIX
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002570050

WPI Acc No: 1980-88069C/198049

Cuprous copper and/or silver halophosphate glasses - having high
electrical conductivity for use in electrochemical devices

Patent Assignee: CORNING GLASS WORKS (CORG

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4226628	A	19801007				198049 B

Priority Applications (No Type Date): US 7961901 A 19790730

Abstract (Basic): US 4226628 A

Cuprous copper and/or silver halophosphate glasses have softening
prints <400 degrees C, coefficients of **thermal** expansion (25-300
degrees C) >180x10⁻⁷/degrees C and room temp. electrical resistivities
<108 ohm cm. The glass compsns. in % wt. oxide basis are specified in
terms of areas defined in the ternary diagrams of the constituents such
as Cu₂O-CuCl-P₂O₅; Ag₂O-**AgCl**-P₂O₅. Several halides may be present
in the glass. The glasses may also be thermochromic.

Used in electrochemical devices such as batteries

Title Terms: CUPROUS; COPPER; SILVER; HALOPHOSPHATE; GLASSES; HIGH;
ELECTRIC; CONDUCTING; ELECTROCHEMICAL; DEVICE

Derwent Class: L01; L03

International Patent Class (Additional): C03C-003/16

File Segment: CPI

Manual Codes (CPI/A-N): L01-A03C; L01-A07A; L01-A07B; L01-L05

13/9/10 (Item 4 from file: 350)
 DIALOG(R) File 350: Derwent WPIX
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003957362

WPI Acc No: 1984-102906/198417

XRAM Acc No: C84-043631

XRPX Acc No: N84-076399

Prod'n. of polarising glass - by drawing a blank clad with a glass having a lower viscosity at the drawing temp.

Patent Assignee: CORNING GLASS WORKS (CORG)

Inventor: LENTZ W; MORSE D L; NOLAN D A; SEWARD T P; SHAY G C

Number of Countries: 005 Number of Patents: 007

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
EP 105701	A	19840418	EP 83305805	A	19830928	198417 B
JP 59083951	A	19840515	JP 83180072	A	19830928	198425
US 4479819	A	19841030	US 82427732	A	19820929	198446
US 4486213	A	19841204	US 82427510	A	19820929	198451
EP 105701	B	19870902				198735
DE 3373301	G	19871008				198741
JP 90040619	B	19900912	JP 83180072	A	19830928	199040

Priority Applications (No Type Date): US 82427732 A 19820929; US 82427510 A 19820929

Abstract (Basic): EP 105701 A

Polarising glass is made by forming a core glass contg. Ag-contg. particles, cladding the core with a skin glass having a viscosity at the softening pt. of the core glass at least 50% less than the core glass, to form a laminate, stretching the laminate at a temp. above the annealing pt. of the core glass at a tensile stress in the core glass of more than 2000 psi; and elongating the Ag-contg. particles to an aspect ratio of at least 2:1.

Glass has good polarising properties at IR wavelengths, esp. 700-3000 nm, and has low haze, making it suitable for aphthalmic and optical use. Breaking during drawing is eliminated.

Abstract (Equivalent): EP 105701 B

Polarising glass is made by forming a core glass contg. Ag-contg. particles, cladding the core with a skin glass having a viscosity at the softening pt. of the core glass at least 50% less than the core glass, to form a laminate, stretching the laminate at a temp. above the annealing pt. of the core glass at a tensile stress in the core glass of more than 2000 psi; and elongating the Ag-contg. particles to an aspect ratio of at least 2:1.

Glass has good polarising properties at IR wavelengths, esp. 700-3000 nm, and has low haze, making it suitable for aphthalmic and optical use. Breaking during drawing is eliminated.

Dwg.2/2

Abstract (Equivalent): US 4486213 A

In the mfr. of a polarising glass a core glass contg. Ag-contg. particles is clad with a skin to form a laminate. The skin glass has a viscosity which is at least 50% than that of the core when at the softening point of the latter. The laminate is stretched at above the annealing point of the core, at or above the softening point temp. of the skin, and at a tensile stress of more than 2000 psi in the core. The Ag-contg. particles are elongated to an aspect ratio of at least 1:1.

ADVANTAGE - Low haze level is obtd., making the glass suitable for optical and ophthalmic uses.

(8pp)

US 4479819 A

Glass article with good polarising properties in the IR region of the radiation spectrum is made from phase separable glasses or photochromic glasses contg. AgCl, AgBr or AgI. Glass contg. Ag and a chloride, bromide, or iodide is melted then cooled and cast into a predetermined shape. The prod. is heated to above the strain point but not higher than 50 deg. C above the softening point so that Ag halide particles of size 200-5000 angstroms form.

The article obtd. is elongated under stress at above the annealing temp. but below the temp. at which the glass has a viscosity of about 10 power 8 poises, so that the halide particles are elongated to an

aspect ratio of at least 5:1 and are aligned in the stress direction. The article is exposed to a reducing atmos. at above 250 deg. C but not higher than 25 deg. C above the annealing point so that a reduced surface layer at least 10 microns thick is formed in which Ag particles are formed with an aspect ratio more than 2:1 and which are deposited in and/or on the elongated particles.

ADVANTAGE - High quality polarising properties are obtd., esp. in wavelength range 700-3000 nm.

(8pp

Title Terms: PRODUCE; POLARISE; GLASS; DRAW; BLANK; CLAD; GLASS; LOWER;
VISCOSITY; DRAW; **TEMPERATURE**
Derwent Class: L01; V07

2/21/03 09:536,460

13/9/9 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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004142466

WPI Acc No: 1984-288006/198446

XRAM Acc No: C84-122403

XRPX Acc No: N84-215083

High expansion glass-ceramic article useful as ferrite support - is
photo-**thermally** crystallised and chemically machined

Patent Assignee: CORNING GLASS WORKS (CORG)

Inventor: MCALINN P

Number of Countries: 006 Number of Patents: 007

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4480044	A	19841030	US 84575902	A	19840201	198446 B
EP 153026	A	19850828	EP 85300463	A	19850124	198535
JP 60180934	A	19850914	JP 8514151	A	19850128	198543
CA 1224956	A	19870804				198735
EP 153026	B	19880309				198810
DE 3561802	G	19880414				198816
JP 92037016	B	19920618	JP 8514151	A	19850128	199229

Priority Applications (No Type Date): US 84575902 A 19840201

Cited Patents: US 2971853; US 3161528; US 4328305

Abstract (Basic): US 4480044 A

Glass-ceramic has coefft. of **thermal** expansion $120-160 \times 10$
and comprises lithium metasilicate, lithium disilicate and quartz
and/or cristobalite crystals dispersed in residual glassy matrix. 90%
or more of compsn. comprises (wt.% oxide basis) 5.5-15 Li₂O, 2-25 Al₂O₃
and 60-85 SiO₂, wherein Al₂O₃:Li₂O is less than 1.7:1; included is at
least one photosensitive metal as 0.001-0.03 Ag or 0.001-1 Cu,
calculated respectively as Au, **AgCl** and Cu₂O.

Pref. compsn. is 79.8 SiO₂, 9.4 Li₂O, 4 K₂O, 3.9 Al₂O₃, 1.5 Na₂O,
1 ZnO, 0.4 Sb₂O₃, 0.012 CeO₂, 0.12 Ag and 0.0013 Au.

ADVANTAGE - Processing temps. for a known compsn. (Fotoceram(RTM)
Code 8603 - US 2971 853) are reduced to modify crystal development and
form prod. with coefft. of **thermal** expansion increased from 105
to $120-160 \times 10^{-7}/\text{deg.C}$.

Abstract (Equivalent): EP 153026 B

A chemically-machinable glass-ceramic having a composition
consisting essentially, expressed in terms of weight percent on the
oxide basis, of 5.5-15% Li₂O, 2-25% Al₂O₃, the weight ratio Al₂O₃:Li₂O
being less than 1.7:1, 60-85% SiO₂, and at least one photosensitive
metal in the indicated proportion selected from the group of
0.001-0.03% gold, computed as Au, 0.001-0.3% silver, computed as
AgCl, and 0.001-1% copper, computed as Cu₂O, the sum of those
components constituting at least 90% by weight of the total
composition, characterised in that it consists predominantly of lithium
metasilicate, lithium disilicate and quartz and/or cristobalite
crystals dispersed in a residual glassy matrix so that the
glass-ceramic exhibits a coefficient of **thermal** expansion over
the interval of 20-400 deg.C of $120-160 \times 10^{-7} \text{ power}(-7) \text{ deg.C}$.

Title Terms: HIGH; EXPAND; GLASS; CERAMIC; ARTICLE; USEFUL; FERRITE;

SUPPORT; PHOTO; **THERMAL**; CRYSTAL; CHEMICAL; MACHINING

Derwent Class: L01; L03; T03; W04

13/9/8 (Item 2 from file: 350)
 DIALOG(R)File 350:Derwent WPIX
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009736213

WPI Acc No: 1994-016063/199402

XRAM Acc No: C94-007669

Glass article with permanent colour avoiding hydrogen atmos. - contains silver and one or more halogen(s)

Patent Assignee: CORNING INC (CORG

Inventor: BORRELLI N F; MORGAN D W; PRASSAS M; SMITH D W

Number of Countries: 008 Number of Patents: 006

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5275979	A	19940104	US 92969388	A	19921030	199402 B
EP 595002	A1	19940504	EP 93114719	A	19930914	199418
JP 6191878	A	19940712	JP 93247738	A	19931004	199432
CN 1086499	A	19940511	CN 93119704	A	19931029	199529
EP 595002	B1	19970618	EP 93114719	A	19930914	199729
DE 69311670	E	19970724	DE 611670	A	19930914	199735
			EP 93114719	A	19930914	

Priority Applications (No Type Date): US 92969388 A 19921030

Abstract (Basic): US 5275979 A

A glass article that exhibits a permanent colour throughout its body comprises R2O, Al2O3, B2O3 and SiO2. The glass batch further contains (i) Ag and at least one halogen selected from Cl and Br, so that after heat treatment the glass will have AgCl and/or AgBr crystals and Ag metal particles dispersed throughout the glass, and (ii) at least one **thermal** reducing agent in its lowest valence state which is at least partially oxidised to its higher valence state by electron transfer to the Ag to produce Ag metal, thereby imparting a permanent colour to the glass.

Pref. the glass compsn., calculated in cation %, consists of 35-70% SiO2, 2-12% Al2O3, 20-35% B2O3, 8-30% R2O selected from 0-20% Li2O, 0-20% Na2O and 0-12% K2O, 0.01-1% of a **thermal** reducing agent selected from SnO2, Sb2O3 and As2O3, 0.225-1% Cl + Br, 0.10-0.5% Ag and 0-0.1% CuO.

USE/ADVANTAGE - The present invention relates to the development of colour in a glass contg. Ag and one or more halogens for use as a photochromic glass article. The present method has a number of advantages over previous methods for producing photochromic glasses, mainly that the need for treatment in a hydrogen-contg. atmos. is avoided, and also that the need for a separate **thermal** treatment is avoided and that the colour is produced throughout the glass and not just in the surface layer.

Dwg.0/4

Abstract (Equivalent): EP 595002 B

A method of producing a glass article having a fixed tint throughout the body of the article which comprises formulating and mixing a batch for an R2O-B2O3-Al2O3-SiO2 base glass, incorporating in the batch a source of silver, a source of at least one halogen other than fluorine, and a **thermal** reducing agent that exhibits at least two valence states and is present in an amount sufficient to partially reduce the silver halide phase, melting the batch and forming the article from the molten glass while essentially retaining the **thermal** reducing agent in its lowest valence state, **thermally** treating the article at a **temperature** in the range of 600-700 deg. C for up to one hour to precipitate a silver halide crystal phase in the glass and to activate a controlled reaction between the **thermal** reducing agent and the silver halide to reduce only a portion of the silver to the metallic state.

Dwg.0/4

13/9/5 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal
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13187113 PASCAL No.: 97-0450879
Two-dimensional small-angle X-ray scattering investigation of stretched borosilicate glasses
POLIZZI S; RIELLO P; FAGHERAZZI G; BARK M; BORRELLI N F
Dipartimento di Chimica Fisica, Universita di Venezia, Dorsoduro 2137, 30123 Venezia, Italy; Abt. Experimentelle Physik, Universitaet Ulm & Hasylab, Hamburg, Germany; Corning Glass Research and Development, Corning, New York 14831, United States
Journal: Journal of applied crystallography, 1997, 30 (p.4) 487-494
ISSN: 0021-8898 CODEN: JACGAR Availability: INIST-13882;
354000068903550100

No. of Refs.: 20 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: Denmark

Language: English

A two-dimensional fit of a suitable model for interpreting small-angle X-ray scattering (SAXS) has been shown to be a valuable tool in obtaining quantitative microstructural information. The model is based on the hypothesis that dilute ellipsoidal particles are arranged parallel to each other. The method has been applied to two glasses containing oriented particles. The investigated materials are both alkali aluminoborosilicate glasses, **thermally** treated and redrawn at a **temperature** above their softening point. The Ag(Cl, Br) crystalline droplets, formed during the preliminary **thermal** treatment, assume, after drawing, a cigar-like shape, oriented in the stretching direction, and give the material birefringence properties. The volumetric particle distribution has an average of 22 x 70 nm and is skewed up to length values of about 1200 nm. The composition of the solid solution, determined by X-ray diffraction (XRD), is Ag(Cl SUB 0 SUB . SUB 3 SUB 5 , Br SUB 0 SUB . SUB 6 SUB 5). When the Ag(Cl,Br) particles on the surface are chemically reduced to Ag, a material with polarizing properties is obtained (Polarcor). For this sample, two distributions of particles have been found: one with an average of 18 x 230 nm and skewed up to 600 nm, and one, very sharp, of much shorter particles (14 x 30nm).

2/21/03 09/536,460

13/9/4 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2003 Inst for Sci Info. All rts. reserv.

01493367 Genuine Article#: HC908 Number of References: 42
Title: ELECTRON-PARAMAGNETIC-RESONANCE STUDY OF SILVER-HALIDE
PHOTOCHROMIC-GLASSES - DARKENING MECHANISM
Author(s): CAURANT D; GOURIER D; PRASSAS M
Corporate Source: ECOLE NATL SUPER CHIM,CNRS,URA 1466,11 RUE PIERRE & MARIE
CURIE/F-75231 PARIS 05//FRANCE/; ECOLE NATL SUPER CHIM,CNRS,URA 1466,11
RUE PIERRE & MARIE CURIE/F-75231 PARIS 05//FRANCE/; CORNING
EUROPE/F-77211 AVON//FRANCE/
Journal: JOURNAL OF APPLIED PHYSICS, 1992, V71, N3 (FEB 1), P1081-1090
Language: ENGLISH Document Type: ARTICLE
Geographic Location: FRANCE
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth
Sciences
Journal Subject Category: PHYSICS, APPLIED
Abstract: The mechanism of darkening of standard silver halide photochromic
glass is studied by electron paramagnetic resonance (EPR) of
photogenerated divalent copper ions. A time resolution of the EPR
spectra was obtained by recording the evolution with the irradiation
time of the EPR intensity at various magnetic-field strengths. It is
shown that only one copper species is photogenerated during darkening.
This species is a Cu(II)-silver vacancy complex oriented along a [110]
direction. The electron ground state has a predominantly d_{z^2}
character. The activation energy of the formation of this complex, $E =$
 0.06 ± 0.01 eV, is controlled by the migration of interstitial silver
ions. It is also shown that the silver vacancy of the complex is
generated during the hole trapping by the monovalent copper ion.
Identifiers--KeyWords Plus: IONIC-CONDUCTIVITY; FLASH-PHOTOLYSIS;
SPIN-RESONANCE; CHLORIDE; **TEMPERATURE**; CRYSTALS; CENTERS;
AGCL(CU; AGR

13/9/2 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS
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0085462 NTIS Accession Number: AD-609 036/XAB

Transmittance of Optical Materials at High **Temperatures** in the 1-
to 12-Micron Range

(Rept. for Jun 61-Jul 63)

Gillespie, D. T. ; Olsen, A. L. ; Nichols, L. W.

Naval Ordnance Test Station China Lake Calif

Corp. Source Codes: 888888888

Report No.: NOTS-TP3586;; NAVWEPS-8558

Oct 64 2p

Journal Announcement: USGRDR6501

Presented at the 49th Annual Meeting of the Optical Society of America,
New York, N. Y., 8 Oct 64.

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Springfield, VA, 22161, USA.

NTIS Prices: PC A02

Transmittance measurements of optical materials were made at 25, 100,
200, 300, and 400C in the 1- to 12-micron range. A continuous proportioning
temperature control system was designed to establish rapidly and to
maintain precisely a given **temperature** level in specially constructed
high-**temperature** cells. The following materials, which are
dielectrics and semiconductors of potential use as windows and IRDOMES in
optical systems at high **temperatures**, were selected: **Corning**
glasses 0160, 8363, and 7905; water-free quartz; Barr and Stroud calcium
aluminate, 37A and 39A; sapphire; IRTRAN-1 and IRTRAN-2; **silver**
chloride; sodium chloride; silicon; and germanium. The results of the
investigation are presented as transmittance vs. wavelength at the five
temperatures. The transmittance of dielectrics remains relatively
unaffected up to 400C; optical materials of this class are restricted in
use at the higher **temperatures** only in the shift of the long
wavelength transmittance limit. With the semiconductors silicon and
germanium, the absorption edge is shifted to longer wavelengths and the
over-all transmittance is greatly reduced with increase of
temperature.

Identifiers: SODIUM CHLORIDE; **SILVER CHLORIDE**; CALCIUM
ALUMINATES; IRTRAN

13/9/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

03213608 INSPEC Abstract Number: A88118311

Title: Optical properties of chemically reduced photochromic glasses

Author(s): Borrelli, N.F.; Wedding, B.

Author Affiliation: Corning Glass Res. & Dev., NY, USA

Journal: Journal of Applied Physics vol.63, no.8, pt.1 p.2756-9

Publication Date: 15 April 1988 Country of Publication: USA

CODEN: JAPIAU ISSN: 0021-8979

U.S. Copyright Clearance Center Code: 0021-8979/88/082756-04\$02.40

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Photochromic glasses subjected to reducing treatments at elevated **temperatures** develop a colored layer through the reduction of the silver halide phase. The nature of this process is investigated with respect to the **temperature** and time of the reduction treatment. An explanation of the color development is offered based on the comparison to an alternate way of producing the reduced silver absorption. In addition, the optical bleaching that is observed is discussed and a mechanism is proposed. (7 Refs)

Subfile: A

Descriptors: borosilicate glasses; light absorption; photochromism; reduction (chemical)

Identifiers: borosilicate glasses; photochromic glasses; reducing treatments; color development; optical bleaching; SiO/sub 2/-B/sub 2/O/sub 3/-**AgCl**-AgBr

Class Codes: A7820W (Other optical properties of bulk materials); A8250 (Photochemistry and radiation chemistry)

Chemical Indexing:

SiO2B2O3AgClAgBr ss - B2O3 ss - SiO2 ss - Ag ss - B2 ss - Br ss - Cl ss - O2 ss - O3 ss - Si ss - B ss - O ss (Elements - 6)

13/9/3 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2003 Inst for Sci Info. All rts. reserv.

02236291 Genuine Article#: KM233 Number of References: 48
Title: BLEACHING MECHANISM OF SILVER-HALIDE PHOTOCHROMIC-GLASSES
Author(s): CAURANT D; GOURIER D; VIVIEN D; PRASSAS M
Corporate Source: ECOLE NATL SUPER CHIM, CHIM APPL ETAT SOLIDE, CNRS, URA
1466, 11 RUE PIERRE & MARIE CURIE/F-75231 PARIS 05//FRANCE/; ECOLE NATL
SUPER CHIM, CHIM APPL ETAT SOLIDE, CNRS, URA 1466, 11 RUE PIERRE & MARIE
CURIE/F-75231 PARIS 05//FRANCE/; CORNING EUROPE/F-77211
AVON//FRANCE/
Journal: JOURNAL OF APPLIED PHYSICS, 1993, V73, N4 (FEB 15), P1657-1668
ISSN: 0021-8979
Language: ENGLISH Document Type: ARTICLE
Geographic Location: FRANCE
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth
Sciences
Journal Subject Category: PHYSICS, APPLIED
Abstract: **Thermal** bleaching of silver halide photochromic glasses is
studied by electron paramagnetic resonance spectroscopy of photoinduced
Cu(II) centers. During exposure to ultraviolet light, the only stable
Cu(II) species is the (Cu(II)V(Ag))A center, which is a Cu(II)-silver
vacancy complex with the vacancy in a nearest position. In the dark,
this center rapidly decays via two parallel channels. The first
involves the dissociation of the complex by displacement of the vacancy
along a [110] direction, with an activation energy $E_3=0.44$ eV and a
frequency factor $k_3(0)=3.4 \times 10(5)$ s⁻¹. The second channel involves the
conversion of the (Cu(II)V(Ag))A center into a (Cu(II)Cl-V(Ag))B center,
where the silver vacancy is in the next nearest position along the
[100] direction. This process occurs with an activation energy $E_1=0.44$
eV and a frequency factor $k_1(0)=3.1 \times 10(5)$ s⁻¹. The (Cu(II)Cl-V(Ag))B
center slowly decays by a vacancy hopping mechanism, with an activation
energy $E_2=0.22$ eV and a frequency factor $k_2(0)=4.6$ s⁻¹. To explain
these two decay channels, it is proposed that the (Cu(II)V(Ag))A and
(Cu(II)Cl-V(Ag))B centers annihilate via the formation of a Cu(I) ion
and a neutral complex (Ag(II)V(Ag))A which migrates to the surface of
the silver halide particle, where electron-hole recombination occurs.
Identifiers--KeyWords Plus: ELECTRON-SPIN-RESONANCE; IONIC-CONDUCTIVITY;
FLASH-PHOTOLYSIS; CENTERS; CHLORIDE; **AGCL**(CU; COPPER
Research Fronts: 91-1552 001 (SURFACE-DIFFUSION OF HYDROGEN; ATOMIC

L40 ANSWER 3 OF 7 HCAPLUS COPYRIGHT 2003 ACS
 AN 1972:411732 HCAPLUS
 DN 77:11732
 TI Jahn-Teller effect on transition metal ions in silver halides. III.
 Interpretation
 AU Ulrici, W.
 CS Zentralinst. Elektronenphys., Dtsch. Akad. Wiss. Berlin, Berlin, Fed. Rep.
 Ger.
 SO Physica Status Solidi B: Basic Research (1972), 51(1), 129-38
 CODEN: PSSBBD; ISSN: 0370-1972
 DT Journal
 LA English
 CC 73-3 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance,
 and Other Optical Properties)
 AB The temp. dependence of the optical absorptions involving orbital doublets
 (Eg) split by dynamic Jahn-Teller effect (JTE) (measured on **AgCl**
 and AgBr doped with Ti3+, Fe2+, and Cr2+) is discussed. From the results
 obtained for excited Eg states the linear JT-coupling parameters and the
 frequencies of the JT-active .epsilon.g mode are derived. These
 .epsilon.g modes were localized around the impurity ion. The small and
temp. independent oscillator strength of the transition
 between the JT-splitting levels of the Eg ground state (measured on Cr2+)
 is a consequence of the action of the dynamic JET. The weak increase of
 the JT-splitting .DELTA.E of the Eg ground state with increasing temp. is
 caused by the temp. dependence of the frequency of the .epsilon.g mode
 following from the thermal **expansion** of the crystal.
 IT 7783-90-6
 RL: PRP (Properties)
 (optical absorption by transition metal ion-contg., dynamic Jahn-Teller
 effect in relation to)
 RN 7783-90-6 HCAPLUS
 CN Silver chloride (AgCl) (9CI) (CA INDEX NAME)

Ag-Cl

2/21/03 09/536,460

13/9/12 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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002021942

WPI Acc No: 1978-34974A/197820

Photosensitive glass articles mfr., contg. silver and metal halide - by exposing to actinic radiation to form a latent image and then reexposure at elevated temp. to deposit a pattern of silver

Patent Assignee: CORNING GLASS WORKS (CORG)

Inventor: FERENGE J

Number of Countries: 009 Number of Patents: 009

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
BE 860752	A	19780510				197820	B
US 4092139	A	19780530				197829	
DE 2800145	A	19780928				197840	
NL 7802843	A	19780919				197840	
JP 53113814	A	19781004				197845	
BR 7801327	A	19781114				197848	
FR 2383891	A	19781117				197851	
GB 1557768	A	19791212				197950	
CA 1099978	A	19810428				198122	

Priority Applications (No Type Date): US 7778160 A 19770316

Abstract (Basic): BE 860752 A

Glass article partly coloured by silver is made by (a) fusing a vitrifiable mixt. contg. an alkali fluoride and ≥ 1 of **AgCl**, AgBr and AgI; (b) shaping the glass, (c) exposing at least part of the article at ambient temp. to an actinic or high energy radiation; (d) heating at least the partly exposed part of the glass articles between the transformation point and the softening point to form nuclei; (e) reexposing part of the glass article at 200-410 degrees C for long enough for Ag to deposit and (f) cooling to ambient temp.

Method utilises polychromatic glasses and is for image pick up. Improved intensity images can be obtd. without consecutive or interrupted heat treatments as in prior art

Title Terms: PHOTSENSITISER; GLASS; ARTICLE; MANUFACTURE; CONTAIN; SILVER; METAL; HALIDE; EXPOSE; ACTINIC; RADIATE; FORM; LATENT; IMAGE; EXPOSE;

2/21/03 09/536,460

13/9/13 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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001208692

WPI Acc No: 1974-82589V/197448

Silver chloride nucleated glass ceramic - is opaque and has
low **thermal** expansion coefft

Patent Assignee: **CORNING GLASS WORKS** (CORG
Number of Countries: 006 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
BE 814858	A	19741112				197448	B
DE 2422568	A	19741128				197449	
US 3854963	A	19741217				197501	
FR 2228732	A	19750110				197509	
JP 50132017	A	19751018				197550	
GB 1427634	A	19760310				197611	

Priority Applications (No Type Date): US 73359431 A 19730511

Abstract (Basic): BE 814858 A

A glass ceramic article is essentially free from alkali(ne earth) oxides e.g. MgO, CaO and SrO, and has a **thermal** expansion coeff. 0-25.10-7/degrees over the range 25-900 degrees C. Glass ceramic slices of thickness <3.175 mm are opaque and white in colour. The opacity results from a crystallinity of >75 wt. %, the greater part of the crystals being not >1 mu in size and comprising mainly solid solns. of zinc petalite and beta quartz. The compsn. of the article is (by wt.) 10-20% ZnO, 10-20% Al2O3, 50-75% SiO2 and <=1% **AgCl** as nucleating agent. The glass ceramic article is prepd. by melting the constits.; cooling the melt to below the transformation region; simultaneously shaping the article; heating at 775-950 degrees C so that crystallisation can take place; and cooling the crystalline body to room temp.

Title Terms: SILVER; CHLORIDE; NUCLEATE; GLASS; CERAMIC; OPAQUE; LOW;

THERMAL; EXPAND; COEFFICIENT

Derwent Class: L02

International Patent Class (Additional): C03B-000/00; C03C-003/22;

2/21/03 09/536,460

13/9/14 (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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000778699

WPI Acc No: 1971-20346S/197112

Photochromatic glass

Patent Assignee: CORNING GLASS WORKS (CORG

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
DE 1596764	B					197112 B

Priority Applications (No Type Date): US 65509164 A 19651122

Abstract (Basic): DE 1596764 B

Glass body with a photochromatic surface layer has a basic composition of (in % by wt): SiO₂, 50-65, Al₂O₃ 7-14, B₂O₃ 15-22, R₂O 5-15 (R₂O Li₂O 0-5, K₂O 0-5, and Na₂O 5-15), and at least one halogen (Cl 0.2-2, Br 0.1-3, and I 0.1-4; the total content of halogens should not exceed 5%), other additives (F, CuO, SrO, BrO, etc) should not exceed 5 degrees C. The surface layer contains crystals of a silver-halide (<1 μ), formed by introducing silver ions in exchange for alkali ions by contacting the surface with Ag. AgNO₃, AgCl, AgBr, Ag₂S or Ag₂SO₄ in the **temperature** range from 100 degrees C below the stress point of the glass to 100 degrees above the softening point. Excellent photochromatic effect is produced.

Title Terms: PHOTOCROMATIC; GLASS

Derwent Class: L01

International Patent Class (Additional): C03C-021/00

File Segment: CPI

11/9/2 (Item 2 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

6156738 INSPEC Abstract Number: A1999-06-4285-001
Title: Ultra-precision bonding for cryogenic fused-silica optics [for Gravity Probe-B]
Author(s): Gwo, D.-H.
Author Affiliation: Hansen Exp. Phys. Lab., Stanford Univ., CA, USA
Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA)
vol.3435 p.136-42
Publisher: SPIE-Int. Soc. Opt. Eng,
Publication Date: 1998 Country of Publication: USA
CODEN: PSISDG ISSN: 0277-786X
SICI: 0277-786X(1998)3435L:136:UPBC;1-7
Material Identity Number: C574-1998-265
U.S. Copyright Clearance Center Code: 0277-786X/98/\$10.00
Conference Title: Cryogenic Optical Systems and Instruments VIII
Conference Sponsor: SPIE
Conference Date: 20-21 July 1998 Conference Location: San Diego, CA, USA
Language: English Document Type: Conference Paper (PA); Journal Paper (JP)
Treatment: Experimental (X)
Abstract: This paper describes the state-of-the-art precision bonding technique for cryogenic fused-silica optics. It was developed for assembling the fused-quartz Gravity Probe-B science instrument, which will be used to prove or disprove Einstein's Theory of General Relativity with unprecedented accuracy and precision. This room-temperature bonding process is based on hydroxide catalysis. The resulting bonding strength is comparable with that of fused silica or fused quartz. The interface is typically 200 nm essentially limited by surface figure mismatch. It is as precise as optical contacting, as reliable as high-temperature frit bonding, as transparent as optical epoxies. So far it is the only bonding approach that meets all the stringent requirements for GP-B's applications at 2.5 K. (10 Refs)
Subfile: A
Descriptors: astronomical telescopes; catalysis; cryogenics; gravitational experiments; joining processes; optical elements; optical glass; optical workshop techniques
Identifiers: cryogenic fused-silica optics; ultra-precision bonding; fused-quartz Gravity Probe-B science instrument; room-temperature bonding process; hydroxide catalysis; surface figure mismatch; star tracking telescope; chemical bonding; 2.5 K; SiO/sub 2

11/9/1 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

6840928 INSPEC Abstract Number: A2001-06-4285F-002

Title: Measuring large aspherics using a commercially available 3D-coordinate measuring machine

Author(s): Otto, W.; Matthes, A.; Schiehle, H.

Author Affiliation: Technologiezentrum, Carl Zeiss, Oberkochen, Germany

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.4003 p.91-7

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 2000 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(2000)4003L:91:MLAU;1-L

Material Identity Number: C574-2000-209

U.S. Copyright Clearance Center Code: 0277-786X/2000/\$15.00

Conference Title: Optical Design, Materials, Fabrication, and Maintenance

Conference Sponsor: SPIE; Eur. Southern Obs

Conference Date: 27-29 March 2000 Conference Location: Munich, Germany

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: A CNC-controlled precision measuring machine is a very powerful tool in the optical shop not only to determine the **surface figure**, but also to qualify the radius of curvature and conic constant of aspherics. We used a commercially available 3D-coordinate measuring machine (CMM, ZEISS UPMC 850 CARAT S-ACC) to measure the shape of the GEMINI 1-m convex secondary mirrors at different lapping and polishing stages. To determine the measuring accuracy we compared the mechanical measurements with the results achieved by means of an interferometrical test setup. The data obtained in an early stage of polishing were evaluated in Zernike polynomials which show a very good agreement. The deviation concerning long wave rotational symmetrical errors was 20 nm rms, whereas the accuracy measuring of mid spatial frequency deviations was limited to about 100 nm rms. (8 Refs)

Subfile: A

Descriptors: aspherical optics; astronomical telescopes; curvature measurement; grinding; measurement errors; mirrors; optical fabrication;

L40 ANSWER 5 OF 7 HCAPLUS COPYRIGHT 2003 ACS

AN 1965:443403 HCAPLUS

DN 63:43403

OREF 63:7778b-d

TI Differences in the behavior of crystals and glasses in the absorption of the far infrared (40-1500 μ) at liquid helium temperature

AU Hadni, Armand; Claudel, Jacques; Gerbaux, Xavier; Morlot, Guy; Munier, Jean Marie

CS Univ. Nancy, Fr.

SO Appl. Opt. (1965), 4(4), 487-94

DT Journal

LA French

CC 10 (Spectra and Some Other Optical Properties)

AB Absorption spectra at liquid He temp. in the far ir are given for thick plates of CsI, **CsBr**, TlBr, TlCl, KI, NaCl, InSb, KBr, CuCl, Al₂O₃, SiO₂, MgO, and LaCl₃. For a thickness of about 3 mm., all these crystals become quasitransparent at very low temp., although they are completely opaque at room temp. This supertransparency of crystals at low temp. gives several far-ir filters with remarkable cutoffs and many available materials to the spectroscopist in a part of the spectrum where only quartz and polyethene were usable up to now. This is also evidence that the main part of the absorption at room temp. comes from the lattice phonons. It decreases with their no. when the crystal is cooled (2-phonon difference process). The small absorption which remains in a few cases (KBr, NaCl, KI) could arise from the 2-phonon addn. process, which is nearly **independent** of **temp.** and gives much less efficient absorption. In the case of glasses, the absorption coeff. is higher by 2 or 3 orders of magnitude and stays const. when the glass is cooled. For quartz glass, the index of **refraction** also seemed invariant. An explanation is proposed in terms of 1 single phonon process, **independent** of **temp.** and allowed by the disorder characteristic of glassy states.

IT **7787-69-1, Cesium bromide**

(spectrum (infrared and microwave) of, at low temp.)

RN 7787-69-1 HCAPLUS

CN Cesium bromide (CsBr) (9CI) (CA INDEX NAME)

Br-Cs

12/9/9

DIALOG(R)File 2:INSPEC

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01152287 INSPEC Abstract Number: A78018029

Title: The effect of lithium and sodium oxides on the thermo-optic properties of silicate and phosphate glasses

Author(s): Molev, V.I.; Shchavelev, O.S.

Journal: Optiko-Mekhanicheskaya Promyshlennost vol.44, no.4 p.27-8

Publication Date: April 1977 Country of Publication: USSR

CODEN: OPMPAQ ISSN: 0030-4042

Translated in: Soviet Journal of Optical Technology vol.44, no.4 p. 212-13

Publication Date: April 1977 Country of Publication: USA

CODEN: SJOTBH ISSN: 0038-5514

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: A pseudobinary system method was applied to a study of the properties of the glasses; 64 glasses were synthesized in silicate and phosphate systems. Changes in **refractive** index, average dispersion, linear **expansion**, temperature coefficient of **refractive** index and thermo-optic constants are tabulated for addition of 1 mol.% of the oxides. Differences in partial properties of the two oxides in silicate and phosphate glasses are also listed. Sodium oxide is a good candidate for the production of **athermal** glasses of both types. (10 Refs)

Subfile: A

12/9/2
DIALOG(R)File 2:INSPEC
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

5448178 INSPEC Abstract Number: A9702-4278-034

Title: **Expansion** of an **athermal** chart into a multilens system
with thick lenses spaced apart

Author(s): Tamagawa, Y.; Tajime, T.

Author Affiliation: Inf. Technol. R&D Center, Mitsubishi Electr. Corp.,
Kanagawa, Japan

Journal: Optical Engineering vol.35, no.10 p.3001-6

Publisher: SPIE,

Publication Date: Oct. 1996 Country of Publication: USA

CODEN: OPEGAR ISSN: 0091-3286

SICI: 0091-3286(199610)35:10L:3001:EACI;1-J

Material Identity Number: 0036-96012

U.S. Copyright Clearance Center Code: 0091-3286/96/\$6.00

Language: English Document Type: Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: An **athermal** chart, which plots chromatic dispersive power and thermal dispersive power on a Cartesian coordinate, is one of the graphical design methods for achromatized and **athermalized** optical systems. We **expand** the ideas of an **athermal** chart into a multilens system that is composed of thick lenses spaced apart by weighting the ratio of the paraxial ray heights at the lenses or the surfaces to the lens power, the chromatic dispersive power, and the thermal dispersive power of each lens or surface. We describe the methods for treating air space and lens thickness on the **athermal** chart with two-component optical systems. It is clarified that the proposed method is effective for **athermalized** optical system design through the evaluation of an IR optical system in the 8- to 11- μ m wavelength band. (17 Refs)

Subfile: A

Descriptors: aberrations; lenses; optical design techniques; optical dispersion; **refractive index**

Identifiers: **athermal** chart; multilens system; thick lenses;

12/9/1

DIALOG(R)File 2:INSPEC

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5718430 INSPEC Abstract Number: A9722-4255R-014, B9711-4320G-039

Title: Ytterbium doped phosphate laser glasses

Author(s): Shibin Jiang; Myers, M.J.; Rhonehouse, D.L.; Hamlin, S.J.; Myers, J.D.; Griebner, U.; Koch, R.; Schonnagel, H.

Author Affiliation: Kirge Inc., Hilton Head, SC, USA

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA)

vol.2986 p.10-15

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 1997 Country of Publication: USA

CODEN: PSISDG ISSN: 0277-786X

SICI: 0277-786X(1997)2986L:10:YDPL;1-Y

Material Identity Number: C574-97163

U.S. Copyright Clearance Center Code: 0277-786X/97/\$10.00

Conference Title: Solid State Lasers VI

Conference Sponsor: SPIE

Conference Date: 10-11 Feb. 1997 Conference Location: San Jose, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Physical, spectral and laser properties of a new Yb/sup 3+/doped phosphate laser glass, QX/Yb, has been developed. This glass exhibits a low thermal **expansion** coefficient and a negative temperature coefficient of **refractive** index, resulting in an acceptable **athermal** behavior and an excellent thermal loading capability. The peak absorption and emission cross sections of Yb/sup 3+/ were measured to be 1.06×10^{-20} cm/sup 2/ and 0.903×10^{-20} cm/sup 2/, respectively. The concentration quenching and the influence of the OH/sup %/content on fluorescence lifetimes were examined. Excellent laser performance with a slope efficiency of 49% and a maximum output power of 400 mW was demonstrated. (11 Refs)

Subfile: A B

Descriptors: fluorescence; laser beams; optical glass; phosphate glasses; radiation quenching; radiative lifetimes; **refractive** index; solid lasers; thermal **expansion**; ytterbium

9/9/1
DIALOG(R)File 2:INSPEC
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6063945 INSPEC Abstract Number: B9812-2550G-019

Title: Advances in the reduction and compensation of film stress in high-reflectance multilayer coatings for extreme ultraviolet lithography

Author(s): Mirkarimi, P.B.; Montcalm, C.

Author Affiliation: Adv. Microtechnol. Program, Lawrence Livermore Nat. Lab.; CA, USA

Journal: Proceedings of the SPIE - The International Society for Optical Engineering Conference Title: Proc. SPIE - Int. Soc. Opt. Eng. (USA)
vol.3331 p.133-48

Publisher: SPIE-Int. Soc. Opt. Eng,

Publication Date: 1998 Country of Publication: USA

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Material Identity Number: C574-98164

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Conference Title: Emerging Lithographic Technologies II

Conference Sponsor: SPIE

Conference Date: 23-25 Feb. 1998 Conference Location: Santa Clara, CA, USA

Language: English Document Type: Conference Paper (PA); Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Due to the stringent **surface figure** requirements for the multilayer-coated optics in an extreme ultraviolet (EUV) projection lithography system, it is desirable to minimize deformation due to the multilayer film stress. However, the stress must be reduced or compensated without reducing EUV reflectivity, since the reflectivity has a strong impact on the throughput of a EUV lithography tool. In this work we identify and evaluate several leading techniques for stress reduction and compensation as applied to Mo/Si and Mo/Be multilayer films. The measured film stress for Mo/Si films with EUV reflectances near 67.4% nm is approximately -420 MPa, while it is approximately +330 MPa for Mo/Be films with EUV reflectances near 69.4% at 11.4 nm. Varying the Mo-to-Si ratio can be used to reduce the stress to near zero levels, but at a large loss in EUV reflectance. The technique of varying the base pressure yielded a 10% decrease in stress with a 2% decrease in reflectance for our multilayers. Post-deposition annealing was performed and it was observed that while the cost in reflectance is relatively high to bring the stress to near zero levels, the stress can be reduced by 75% with only a 1.3% drop in reflectivity at annealing temperatures near 200 degrees C. A study of annealing during Mo/Si deposition was also performed; however, no practical advantage was observed by heating during deposition. A new **non-thermal** buffer-layer technique was developed to compensate for the effects of stress. Using this technique with amorphous silicon and Mo/Be buffer-layers it was possible to obtain Mo/Be and Mo/Si multilayer films with near zero net film stress and less than a 1% loss in reflectivity. For example a Mo/Be film with 68.7% reflectivity at 11.4 nm and a Mo/Si film with 66.5% reflectivity at 13.3 nm were produced with net stress values less than 30 MPa. (38 Refs)

Subfile: B

Descriptors: annealing; beryllium; internal stresses; molybdenum; optical films; photolithography; reflectivity; silicon

Identifiers: film stress; multilayer coating; extreme ultraviolet projection lithography; **surface figure**; deformation; reflectivity; EUV reflectance; annealing; buffer layer; 11.4 nm; 13.4 nm; 200 C; Mo-Si; Mo-Be

Class Codes: B2550G (Lithography); B4190F (Optical coatings and filters)

Chemical Indexing:

Mo-Si int - Mo int - Si int - Mo el - Si el (Elements - 1,1,2)

Mo-Be int - Be int - Mo int - Be el - Mo el (Elements - 1,1,2)

Numerical Indexing: wavelength 1.14E-08 m; wavelength 1.34E-08 m; temperature 4.73E+02 K

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11/9/6 (Item 1 from file: 94)
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03187313 JICST ACCESSION NUMBER: 97A0146577 FILE SEGMENT: JICST-E
Performance of a Convenient Profiler for Measurement of Mirror

Surface Figure.

SUGAWARA HIDENAO (1); YANAGIHARA MIHIRO (2); ASAOKA SEIJI (3); MAEZAWA
HIDEKI (3)

(1) Gunma Univ., Fac. of Educ.; (2) Tohoku Univ.; (3) Natl. Lab. for High
Energy Phys.

Hoshako(Journal of the Japanese Society for Synchrotron Radiation Research)
, 1996, VOL.9,NO.4, PAGE.335-343, FIG.9, REF.9

JOURNAL NUMBER: L0956AAP ISSN NO: 0914-9287

UNIVERSAL DECIMAL CLASSIFICATION: 681.7 535-34

LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Original paper

MEDIA TYPE: Printed Publication

ABSTRACT: In order to estimate mirror **surface figures** over
rather wide area, we have developed a convenient profiler. It is usable
even if a mirror is under exposure to synchrotron radiation. It
consists of a small-sized laser source and a position sensitive
detector which are mounted on X and Y platforms driven by stepping
motors. After the laser light is incident on a mirror surface, the
reflected laser light is detected with the position sensitive detector.
When a set of the laser source and the detector is scanned parallel to
the mirror surface, we can know variation in position on the detector
surface where the laser light reflected from the mirror surface falls.
Since this position variation arises from variation in the angle of
reflection of the laser light on the mirror surface, it is reduced to a
slope curve for the mirror surface parallel to an axis along which the
laser light is scanned. Therefore, we can derive the surface profile by
integrating the slope curve along the scanning axis. The Application of
the profiler to mirrors under exposure to high power synchrotron
radiation is described. (author abst.)

DESCRIPTORS: reflecting mirror; synchrotron radiation; beam line; in situ
observation; shape measurement; surface quality; laser application;
silicon carbide; undulator; thermal deformation

BROADER DESCRIPTORS: mirror; optical system; bremsstrahlung;
electromagnetic wave; wave motion; electromagnetic radiation; radiation
; radioactive ray; **nonthermal** radiation; beam technique;

11/9/5 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
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05395855 E.I. No: E2099104847451

Title: Interferometric testing of the VLT tertiary mirrors

Author: Schulte, Stefan; Doerband, Bernd; Schillke, Frank; Wiedmann, Wolfgang; Michel, Alain

Corporate Source: Carl Zeiss, Oberkochen, Ger

Conference Title: Proceedings of the Interferometry '99: Applications

Conference Location: Pultusk, Pol Conference Date: 19990920-19990923

Sponsor: SPIE; KBN; SEM; DGaO; WLT

E.I. Conference No.: 55761

Source: Proceedings of SPIE - The International Society for Optical Engineering v 3745 1999. p 14-24

Publication Year: 1999

CODEN: PSISDG ISSN: 0277-786X

Language: English

Document Type: JA; (Journal Article) Treatment: G; (General Review)

Journal Announcement: 9911W4

Abstract: The tertiary mirrors of the Very Large Telescope (VLT), one of the most powerful astronomical telescope systems, were manufactured and tested at Carl Zeiss. These components are lightweight elliptical plane mirrors with diameters of 1250 mm and 880 mm for the long and short axis, respectively. A particular challenge of this project was the outer rim specification of 200 nm peak-to-valley mirror surface deviation. This value had to be obtained under all operational load cases differing in the influence of gravity on the lightweight structure of the mirror. The mirror had to be tested on its support cell. For the absolute calibration of the large plane mirror surface a Ritchey-Common test was performed at two different angular positions. The test setup was adapted as close as possible to the operational position of the mirror in the telescope. A special algorithm for the calculation of the **surface figure** error from the wavefront data sets was developed. The results and special challenges of the absolute calibration procedure of the mirror surface will be presented and discussed. (Author abstract) 3 Refs.

Descriptors: *Optical telescopes; Mirrors; Optical testing; Interferometry; Surface measurement; Algorithms; Calibration

Identifiers: Very large telescopes (VLT)

Classification Codes:

741.3 (Optical Devices & Systems); 941.3 (Optical Instruments); 941.4 (Optical Variables Measurements); 943.2 (Mechanical Variables Measurements)

741 (Optics & Optical Devices); 941 (Acoustical & Optical Measuring Instruments); 943 (Mechanical & Miscellaneous Measuring Instruments)

74 (OPTICAL TECHNOLOGY); 94 (INSTRUMENTS & MEASUREMENT)

11/9/4 (Item 1 from file: 6)
DIALOG(R)File 6:NTIS
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2107792 NTIS Accession Number: DE98058762/XAB

Advances in the reduction and compensation of film stress in high-reflectance multilayer coatings for extreme ultraviolet lithography applications

Mirkarimi, P. B.

USDOE, Washington, DC.

Corp. Source Codes: 888888888

Report No.: UCRL-JC-128293

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Languages: English Document Type: Conference proceeding

Journal Announcement: GRAI9907; ERA9901

Joint MMM-intermag conference (7th).

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Due to the stringent **surface figure** requirements for the multilayer-coated optics in an extreme ultraviolet (EUV) projection lithography system, it is desirable to minimize deformation due to the multilayer film stress. However, the stress must be reduced or compensated without reducing EUV reflectivity, since the reflectivity has a strong impact on the throughput of a EUV lithography tool. In this work we identify and evaluate several leading techniques for stress reduction and compensation as applied to Mo/Si and Mo/Be multilayer films. The measured film stress for Mo/Si films with EUV reflectances near 67.4% at 13.4 nm is approximately - 420 MPa (compressive), while it is approximately +330 MPa (tensile) for Mo/Be films with EUV reflectances near 69.4% at 11.4 nm. Varying the Mo-to-Si ratio can be used to reduce the stress to near zero levels, but at a large loss in EUV reflectance (> 20%). The technique of varying the base pressure (impurity level) yielded a 10% decrease in stress with a 2% decrease in reflectance for our multilayers. Post-deposition annealing was performed and it was observed that while the cost in reflectance is relatively high (3.5%) to bring the stress to near zero levels (i.e., reduce by 100%), the stress can be reduced by 75% with only a 1.3% drop in reflectivity at annealing temperatures near 200(degrees)C. A study of annealing during Mo/Si deposition was also performed; however, no practical advantage was observed by heating during deposition. A new **non-thermal (athermal)** buffer-layer technique was developed to compensate for the effects of stress. Using this technique with amorphous silicon and Mo/Be buffer-layers it was possible to obtain Mo/Be and Mo/Si multilayer films with a near zero net film stress and less than a 1% loss in reflectivity. For example a Mo/Be film with 68.7% reflectivity at 11.4 nm and a Mo/Si film with 66.5% reflectivity at 13.3 nm were produced with net stress values less than 30 MPa.

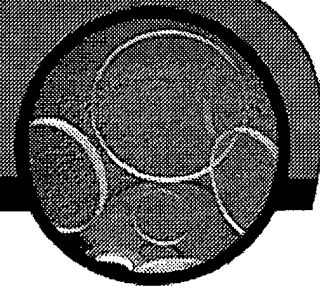
Descriptors: *Coatings; Ultraviolet Radiation; Reflectivity; Molybdenum Alloys; Silicon Alloys; Beryllium Alloys; Annealing; Meetings

Identifiers: EDB/360100; NTISDE

Section Headings: 71E (Materials Sciences--Coatings, Colorants, and Finishes); 46C (Physics--Optics and Lasers); 82B (Photography and Recording Devices--Photographic Techniques and Equipment); 49E (Electrotechnology--Optoelectronic Devices and Systems)



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Frequently Asked Optics Questions

2) What is "Surface Figure" and why is it important?

Along with the selection of the proper substrate material, actual damage threshold and long lifetime can greatly depend on the surface preparation of the optic. Most excimer laser optics are specified by surface figure and surface quality.

Surface figure is a measurement of the deviation from an ideal surface in terms of waves, peak to valley. This is typically specified as 1/10th wave or better at 633 nm for most surfaces of excimer optics. For some special applications, surface figure specifications can be even greater, in the range of 1/20th wave or better.

Surface quality is defined as the number of actual flaws in an optical surface in terms of scratches and digs, based on military specifications. Surface quality of excimer optics is most often specified as 20-10 or better for optimum, low scatter performance of the optics. Precise fabrication techniques designed to produce these types of surfaces, on crystalline materials such as MgF_2 and CaF_2 , contribute to the overall optical performance of the excimer laser.



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